CLAIMS

1. A retarder comprising:

a substrate, and on or above the substrate

a first optically anisotropic layer formed of a composition comprising a rod-like liquid-crystal compound, in which the rod-like molecules are aligned homogeneously, and substantially generating a phase difference of π at 550 nm, and

a second optically anisotropic layer formed of a composition comprising a rod-like liquid-crystal compound, in which the rod-like molecules are aligned homogeneously, and substantially generating a phase difference of π/2 at 550 nm;

wherein at least one of the rod-like liquid-crystal compounds is denoted by Formula (I) below;

Formula (I)

Q^1-L^1-A^1-L^3-M-L^4-A^2-L^2-Q^2

where, Q^1 and Q^2 respectively denote a polymerizable group; L^1, L^2, L^3 and L^4 respectively denote a single bond or a divalent linking group provided that at least either of L^3 and L^4 represents -O-CO-O-; A^1 and A^2 respectively denote C2-20 spacer group, and M denotes a mesogen group; and

an in-plane slow axis of the second optically anisotropic layer and an in-plane slow axis of the first optically anisotropic layer cross substantially at 60 degrees.

2. The retarder of claim 1, wherein M in the Formula (I) is a group denoted by Formula (II):

Formula (II)

$-(-W^1-L^5)_n-W^2-$

where, W^1 and W^2 respectively denote a divalent alicyclic group, divalent aromatic group or divalent heterocyclic group; L^5 denotes a single bond or a linking group; and n is 1, 2 or 3.

3. The retarder of claim 1, wherein the substrate has a longitudinal direction, the in-plane slow axis of the first optically anisotropic layer and the longitudinal direction of the transparent substrate cross substantially at +30 degrees; and the in-plane slow axis of the second optically anisotropic layer and the longitudinal direction of the transparent substrate cross substantially at -30 degrees.

4. The retarder of claim 3, wherein a rubbing axis for predetermining an orientation angle of the rod-like molecules in the first optically anisotropic layer and the longitudinal direction of the transparent substrate cross substantially at 30 degrees; and a rubbing axis for predetermining an orientation angle of the rod-like molecules in the second optically anisotropic layer and the longitudinal direction of the transparent substrate cross substantially at -30 degrees.

5. The retarder of claim 4, wherein a surface of the first optically anisotropic layer has the rubbing axis for predetermining an orientation angle of the rod-like molecules in the second optically anisotropic layer.

6. The retarder of claim 1, wherein at least one of the optically anisotropic layers comprises a compound denoted by

Formula (V):

Formula (V)

$(Hb\text{-}L^2\text{-})_nB^1$

where Hb denotes a C6-40 aliphatic group or oligosiloxanoxy group having a C4-40 aliphatic group; L^2 represents a divalent linking group selected from the group consisting of -O-, -S-, -CO-, $-NR^5-$, $-SO_2-$, an alkylene group, alkenylene group, arylene group and any combinations thereof; R^5 represents a hydrogen atom or a C1-6 alkyl group; n represents an integer from 2 to 12; and B^1 represents an n-valent group containing at least three cyclic structures, so that the rod-like molecules in the layer are aligned homogenously with a not greater than 10 degrees tilt angle relative to a layer plane.

7. The retarder of claim 6, wherein B^{51} is an n-valent group denoted by Formula (V-a);

Formula (V-a)

$(-Cy^{51}\text{-}L^{53}\text{-})_n\ Cy^{52}$

where Cy^{51} is a divalent cyclic group; L^{53} is a divalent linking group selected from the group consisting of a single bond, -alkylene-, -alkenylene-, -alkynylene-, -O-, -S-, -CO-, -NR-, $-SO_2-$ and any combinations thereof; Cy^{52} is an n-valent cyclic group; and n is an integer from 2 to 12.

8. A circular polarizer comprising:

a linear polarizer film having a transparent axis substantially inclined at +45 degrees or -45 degrees relative to a longitudinal direction thereof,

a substrate having a longitudinal direction,

a first optically anisotropic layer formed of a composition comprising a rod-like liquid-crystal compound, in which the rod-like molecules are aligned homogeneously, and substantially generating a phase difference of π at 550 nm, and

a second optically anisotropic layer formed of a composition comprising a rod-like liquid-crystal compound, in which the rod-like molecules are aligned homogeneously, and substantially generating a phase difference of π/2 at 550 nm;

wherein at least one of the rod-like liquid-crystal compounds is denoted by Formula (I) below;

Formula (I)

Q^1-L^1-A^1-L^3-M-L^4-A^2-L^2-Q^2

where, Q^1 and Q^2 respectively denote a polymerizable group; L^1, L^2, L^3 and L^4 respectively denote a single bond or a divalent linking group provided that at least either of L^3 and L^4 represents -O-CO-O-; A^1 and A^2 respectively denote a C2-20 spacer group, and M denotes a mesogen group;

the transparent axis of the linear polarizer film and the longitudinal direction of the substrate cross substantially at +45 degrees or -45 degrees; and

an in-plane slow axis of the second optically anisotropic layer and an in-plane slow axis of the first optically anisotropic layer cross substantially at 60 degrees.

9. The circular polarizer of claim 8, wherein M in the Formula (I) is a group denoted by denotes is denoted by Formula (II):

Formula (II)

$-(-W^1-L^5)_n-W^2-$

where, W^1 and W^2 respectively denote a divalent alicyclic group, divalent aromatic group or divalent heterocyclic group; L^5 denotes a single bond or a linking group; and n is 1, 2 or 3.

10. The circular polarizer of claim 8, wherein the in-plane slow axis of the first optically anisotropic layer and a longitudinal direction of the substrate cross substantially at +30 degrees; and the in-plane slow axis of the second optically anisotropic layer and the longitudinal direction of the substrate cross substantially at -30 degrees.

11. The circular polarizer of claim 8, wherein a rubbing axis for predetermining an orientation angle of the rod-like molecules in the first optically anisotropic layer and the longitudinal direction of the substrate cross substantially at +30 degrees; and a rubbing axis for predetermining an orientation angle of the rod-like molecules in the second optically anisotropic layer and the longitudinal direction of the substrate cross substantially at -30 degrees.

12. The circular polarizer of claim 11, wherein a surface of the first optically anisotropic layer has the rubbing axis for predetermining an orientation angle of the rod-like molecules in the second optically anisotropic layer.

13. The retarder of claim 8, wherein at least one of the optically anisotropic layers comprises a compound denoted by Formula (V):

Formula (V)

$(Hb\text{-}L^{2}\text{-})_{n}B^{1}$

where Hb denotes a C6-40 aliphatic group or oligosiloxanoxy group having a C4-40 aliphatic group; L^{2} represents a divalent linking group selected from the group consisting of -O-, -S-, -CO-, $-NR^{5}-$, $-SO_{2}-$, an alkylene group, alkenylene group, arylene group and any combinations thereof; R^{5} represents a hydrogen atom or a C1-6 alkyl group; n represents an integer from 2 to 12; and B^{1} represents an n-valent group containing at least three cyclic structures, so that the rod-like molecules in the layer are tilted at not greater than 10 degrees relative to a layer plane.

14. The circular polarizer of claim 13, wherein B^{51} is an n-valent group denoted by Formula (V-a);

Formula (V-a)

$(-Cy^{51}\text{-}L^{53}\text{-})_{n}\ Cy^{52}$

where Cy^{51} is a divalent cyclic group; L^{53} is a divalent linking group selected from the group consisting of a single bond, -alkylene-, -alkenylene-, -alkynylene-, -O-, -S-, -CO-, -NR-, $-SO_{2}-$ and any combinations thereof; Cy^{52} is an n-valent cyclic group; and n is an integer from 2 to 12.